REMARKS

Information Disclosure Statement:

The Examiner has requested copies of references 3-6 from Applicants' 1449 form filed July 25, 2002, since copies could not be located at the Patent Office. The requested copies are enclosed herewith.

Defective Declaration:

The Examiner has stated that the inventors' Declaration is defective because inventor Sim altered the zipcode of her residential address without initialing and dating the change. Applicants are in the process of correcting the deficiency in the Declaration, but due to an inability to locate Dr. Sim or obtain her signature at this time, Applicants respectfully request that the submission of a substitute Declaration be deferred until the matter can be resolved pursuant to 37 CFR 1.67.

Specification:

The Examiner has objected to the title of the application and has suggested the new title, "Flea Saliva Protein $PfspI_{155}$". Applicants are amenable to changing the title, but request that the amendment wait until the scope of allowable claims has been determined before amending the title. For example, given the current claim scope, Applicants would prefer a title such as "Flea Saliva Protein $PfspI_{155}$ and Fragments Thereof".

Claim Objections:

The Examiner has objected to Claims 44 and 45 due to a misspelling of *Ctenocephalides*. Claims 44 and 45 have been amended to correct the spelling.

Claim Amendments:

Claim 43 has been amended to add a functional limitation with regard to the claimed fragment of SEQ ID NO:62. Specifically, the fragment binds to an IgE antibody having specificity for $PfspI_{155}$. Support for this amendment is found in the specification, for example, on page 10, line 14 to page 11, line 1; page 14, line 12 to page 15, line 2; page 15, lines 15-17; page 47, line 14 to

page 48, line 1; page 52, lines 19-21 or page 54, lines 8-13. All other claim amendments are clerical in nature.

Statement Regarding Claims 56 and 59 Under 35 U.S.C. § 112, Second Paragraph:

The Examiner has stated that Claims 56 and 59 are definite under 35 U.S.C. § 112, second paragraph with regard to the meaning of the term "$PfspI_{155}$". Applicants are confused as to whether this was the Examiner's intention or whether this was supposed to be a rejection of Claims 56 and 59. The Examiner contends that the specification does not give any indication that the term "$PfspI_{155}$" is meant to be interpreted as any other protein than SEQ ID NO:62.

Applicants provide the following comments in response to this statement or rejection, whichever the case may be. $PfspI_{155}$ is a specific recombinant flea saliva protein consisting of SEQ ID NO:62. Therefore, $PfspI_{155}$ is a protein of defined amino acid sequence and the Examiner is correct that $PfspI_{155}$ should not be interpreted as any other protein than the protein consisting of SEQ ID NO:62.

If this was intended to be a rejection, then Applicants respectfully request that the rejection be withdrawn.

Objection to the Specification and Rejection of Claims 43-45, 57 and 58 Under 35 U.S.C. § 112, First Paragraph (written description):

The Examiner has objected to the specification and has rejected Claims 43-45, 57 and 58 under 35 U.S.C. § 112, first paragraph, on the basis of written description. Specifically, the Examiner contends that Claim 43 is drawn to a genus of isolated proteins comprising a fragment of SEQ ID NO:62 having any function. The Examiner contends that the specification teaches the structure of only nine representative species of such proteins (i.e., SEQ ID NOs:53, 62, 65, 70,72, 75, 77, 78 and 87). It is asserted that the disclosure of these species is insufficient to adequately describe the entire genus of claimed polypeptides and that the specification fails to describe any identifying characteristics or properties other than being a protein comprising a fragment of SEQ ID NO:62.

Applicants traverse the rejection of Claims 43-45, 57 and 58 under 35 U.S.C. § 112, first paragraph. Initially, Applicants are confused by the Examiner's reference to the teaching of nine representative species of the claimed genus of proteins. Applicants are claiming only SEQ ID NO:62 and fragments thereof. The remaining eight sequences are *non-elected* proteins and are no longer claimed. The Examiner's argument seems to imply that Applicants are claiming something broader than even the group of nine flea saliva proteins but again, only proteins comprising SEQ ID NO:62 and fragments thereof are claimed. It appears from the remarks that the Examiner is not giving the recited sequence any patentable weight, but this is not proper because the claim clearly recites SEQ ID NO:62. SEQ ID NO:62 is a full-length protein with a defined function (e.g., flea saliva allergen). Therefore, there is little variation among proteins comprising SEQ ID NO:62 since they all share SEQ ID NO:62 as a necessary common feature. Moreover, Claim 43 has been amended to recite a functional limitation for fragments of SEQ ID NO:62, wherein the fragment binds an IgE antibody that is specific for the originally isolated protein consisting of SEQ ID NO:62 ($PfspI_{155}$). Support for this amendment is described above. Therefore, there is little variation among these fragments because all must be a portion of SEQ ID NO:62 and have the recited common function, which directly correlates with the diagnostic and therapeutic utilities of the protein.

In view of the foregoing remarks, Applicants respectfully request that the Examiner withdraw the rejection of Claims 43-45, 57 and 58 under 35 U.S.C. § 112, first paragraph.

Objection to the Specification and Rejection of Claims 43-45, 57 and 58 Under 35 U.S.C. § 112, First Paragraph (enablement):

The Examiner has objected to the specification and has rejected Claims 43-45, 57 and 58 under 35 U.S.C. § 112, first paragraph, on the basis of enablement. Specifically, the Examiner states that the specification is enabling for the polypeptide of SEQ ID NO:62 but does not reasonably provide enablement for any isolated protein comprising a fragment of SEQ ID NO:62. The Examiner states that the specification provides working examples describing methods of isolating at least nine different *Ctenocephalides felis* polypeptides, but fails to provide guidance for isolating *any* protein, including *any Ctenocephalides felis* protein, or any proteins that are not associated with FAD. The Examiner further contends that the methods disclosed in the specification (e.g.,

hybridization and PCR) would not be applicable for isolating nucleic acid sequences that are highly variant from those disclosed in the specification. The Examiner also states that the specification describes "$PfspI_{155}$" as having the amino acid sequence of SEQ ID NO:62 and therefore, Claims 56 and 59 meet the written description requirement.

Applicants traverse the Examiner's rejection of Claims 43-45, 57 and 58 under 35 U.S.C. § 112, first paragraph, on the basis of enablement. It is noted that the claims as previously presented and as currently amended refer only to proteins comprising SEQ ID NO:62 or a fragment thereof. Again, it is noted that the non-elected sequences are not claimed and the claims do not extend beyond sequences related to SEQ ID NO:62. Therefore, Applicants are clearly not claiming *any* protein or *any Ctenocephalides felis* protein. Fragments of SEQ ID NO:62 are certainly not highly variant from the sequences disclosed in the specification (e.g., SEQ ID NO:62) because a fragment is simply a portion of the full-length sequence. Therefore, the Examiner's comment regarding the inability of using hybridization or PCR to isolate nucleic acid sequences as claimed would seem to be incorrect, as one of skill in the art can easily produce or identify fragments of a given sequence, including by using hybridization or PCR. With regard to the presently claimed fragments, the fragments are now required to have a biological function that is correlated with the utility of the proteins and fragments disclosed in the specification (e.g., in a diagnostic assay). Methods to determine binding of an antibody to a protein or peptide are well known in the art and several immunoassays are described in detail in the specification (e.g., see page 47, line 1 to page 54, line 2 or Example 10).

In view of the foregoing discussion, Applicants respectfully request that the Examiner withdraw the rejection of Claims 43-45, 57 and 58 under 35 U.S.C. § 112, first paragraph.

Rejection of Claims 43-45 and 58 Under 35 U.S.C. § 102(b):

The Examiner has rejected Claims 43-45 and 58 under 35 U.S.C. § 102(b), contending that these claims are anticipated by Heath et al. The Examiner contends that Heath et al. teach isolation of *Ctenocephalides felis* flea midgut antigen proteins and the use of such proteins for generating antibodies. The Examiner apparently considers this to be sufficient to teach a fragment of SEQ ID NO:62 or compositions comprising such fragments.

Applicants traverse the rejection of Claims 43-45 and 58 under 35 U.S.C. § 102(b). Initially, Applicants submit that the Examiner is not giving proper weight to the sequence recited in the claims (i.e., SEQ ID NO:62). SEQ ID NO:62 or the recited fragment thereof is a necessary feature of the claimed protein. Heath et al. do not teach or suggest SEQ ID NO:62 or a fragment thereof. Indeed, the Examiner states on page 7 of the Office Action that he can find no teaching or suggestion in the prior art directed to the polypeptide of SEQ ID NO:62. Moreover, Heath et al. describe the production and use of supernatant fractions derived from the midgut of fleas, whereas the present claims are directed to a particular flea saliva protein and fragments thereof. There is no teaching in Heath et al. that proteins in the midgut of fleas are also found in the saliva of fleas. In addition, the supernatant taught by Heath et al. contains a mixture of unidentified flea midgut proteins, whereas the present claims are directed to proteins comprising a specific amino acid sequence and fragments thereof.

Therefore, it is submitted that Heath et al. clearly do not teach or suggest the claimed protein or fragment thereof, nor compositions comprising such proteins. The Examiner is respectfully requested to withdraw the rejection of Claims 43-45 and 58 under 35 U.S.C. § 102(b).

Rejection of Claim 57 Under 35 U.S.C. § 102(b):

The Examiner has rejected Claim 57 under 35 U.S.C. § 102(b), contending that this claim is anticipated by Yang et al. Claim 57 limits the protein of Claim 43 to a recombinantly produced protein. The Examiner asserts that Yang et al. teach a recombinantly produced aspartate transcarbamoylase and that this anticipates Claim 57 as written.

Applicants traverse the Examiner's rejection of Claim 57 under 35 U.S.C. § 102(b). First, the Examiner is respectfully reminded that Claim 57, as written, requires that the recombinantly produced protein be the protein of Claim 43 and thus includes all of the limitations of Claim 43. The limitations of Claim 43 with respect to the recited sequence have been discussed above with regard to the first rejection under § 102(b) and include the necessary element of SEQ ID NO:62 or the recited fragment thereof. Yang et al. describes recombinant aspartate transcarbamoylase polypeptide chains and makes no mention of any flea proteins, including PfspI having SEQ ID

NO:62 or fragments thereof. Yang et al. clearly do not teach or suggest the present invention as claimed in Claim 57.

In view of the foregoing remarks, the Examiner is respectfully requested to withdraw the rejection of Claim 57 under 35 U.S.C. § 102(b).

Applicants have attempted to respond to all of the Examiner's concerns as set forth in the March 6 Office Action. Any further questions regarding Applicants' position should be directed to the below-named agent at (303) 863-9700.

Respectfully submitted,

SHERIDAN ROSS P.C.

By: Angela Dallas

Angela K. Dallas
Registration No. 42,460
1560 Broadway, Suite 1200
Denver, CO 80202-5141
(303) 863-9700

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